IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

NCS MULTISTAGE INC.,

Plaintiff,

v.

NINE ENERGY SERVICE, INC.,

Defendant.

CIVIL ACTION NO. 6:20-CV-00277-ADA

JURY TRIAL DEMANDED

DEFENDANT NINE ENERGY SERVICE, INC.'S OPENING BRIEF ON CLAIM CONSTRUCTION

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I. INTRODUCTION AND SUMMARY OF ARGUMENTS

The asserted claims of U.S. Patent 10,465,445 (the '445 Patent) are indefinite. In an attempt to distinguish prior art, NCS Multistage Inc. ("NCS") crafted an insolubly ambiguous limitation – that "the region where the rupture disc is attached . . . is parallel to the internal diameter of the casing string." This limitation requires two features—a region and a diameter—with no inherent direction to be parallel, rendering the term indecipherable and therefore indefinite. NCS appears to recognize this fatal defect, proposing a construction that effectively amends this limitation by substituting "inner wall" for "internal diameter." But claim construction cannot be used to amend the claims. NCS's proposed construction should therefore be rejected.

The '445 Patent contains another equally indefinite limitation that requires a rupture disc "configured to rupture when exposed to a rupturing force greater than the rupture burst pressure." But forces and pressures are not comparable features, and the specification provides no conversion from one to the other. Again, NCS appears to recognize the issue, construing the term "rupturing force" to mean "hydraulic pressure" in some instances, but "impact forces" in others. But NCS cannot have it both ways – the claim term is simply indefinite.

Beyond these terms that Nine Energy, Inc. ("Nine") shows to be indefinite, Nine presents constructions that will aid the factfinder by explaining the ordinary meaning of various claim terms to a person of ordinary skill in the art at the time of the invention, in view of the specification. For the reasons that follow, Nine respectfully requests that the Court enter an order adopting constructions and holding terms indefinite as discussed below.

II. BACKGROUND OF THE ASSERTED PATENT & PROSECUTION HISTORY

The '445 Patent describes a float tool for use in casing flotation, a well-known technology developed in the 1980's to extend the lateral reach of horizontal wellbores. Ex. 1, ¶¶ 37-47, 51.

Casing flotation overcomes the friction between the wellbore and the casing that can cause the casing to become stuck in extended-reach horizontal wells. Ex. 1, ¶ 38. Extended-reach drilling with casing flotation is an economical and common approach for building extended reach horizontal wells, used throughout the world. Ex. 1, ¶ 39.

A. Technology Background

Casing flotation uses an air chamber near the lower end of the casing string, sealed with a plug, to reduce the friction between the casing and the formation. Ex. 1, ¶ 43. Plugs with rupture discs were eventually used in place of retrievable plugs to seal the chamber, thereby eliminating the costs associated with retrieval. Ex. 1, ¶ 46

The '445 Patent "relates to a method and apparatus for sealing well casings." Ex. 2, at 1:16-17. The '445 Patent alleges that prior art plugs may not be capable of restoring full casing inside diameter ("ID") after flotation. Ex. 2, at 1:47-55; Ex. 1, ¶ 54-55. The '445 Patent thus describes a "float chamber" where "parts of the float chamber could be easily removed from the wellbore and/or that the removal could result in full casing ID." Ex. 2, at 1:56-67; Ex. 1, ¶ 55.

The '445 Patent further describes that the rupture "disc may be engaged within the casing string by a securing mechanism," such as a shear ring, which "provides for seating rupture disc in lower tubular member, and acts as a disengagable constraint." Ex. 2, at 2:10-11, 8:44-62, FIGs. 2-3; Ex. 1, ¶ 57. After the casing has been landed, the "rupture disc is then burst by pressuring the casing from the surface." Ex. 2, at 6:24-26; Ex. 1., ¶ 58. The resulting impact destroys the rupture disc, and allows full casing ID to be restored. Ex. 2, at 11:27-41; Ex. 1, ¶ 58; *see also* Ex. 2 at 11:46-48 ("the impact force on rupture disc 30, combined with the hydraulic pressure, accomplish the breaking of rupture disc.").

B. Relevant Prosecution History

The application that led to the '445 Patent was not allowed until after it received three rejections from the Examiner. In the last of these, the Examiner rejected the claims as obvious over a journal article that described casing flotation, and U.S. Patent 5,479,986 to Gano ("*Gano*"). Ex. 3, at 3-10. In particular, the Examiner rejected the claims in view of an embodiment at Figure 3 in *Gano* that illustrated a domed well plug. *Id.*, at 4.

To overcome *Gano*, applicant amended the claims to recite that "the region where the rupture disc is attached . . . is parallel to the internal diameter of the casing string." Ex. 4, at 2, 5-6, 9, 11-12. No other amendments were made. Thus, this is the sole limitation that distinguishes the claims of the '445 Patent over the prior art. *See id.* Applicant argued that this amendment overcame *Gano* because "Gano's plug and rupture disc are in sealing engagement with and attached to a region of a tubular member that is **not parallel** to the internal diameter of the casing string, but is instead sloped." *Id.*, at 12 (emphasis added). The Examiner allowed the claims with this limitation, without further comment on the reasons for allowance. Ex. 5.

III. LEGAL STANDARD

A. Claim Construction

Claim terms generally are given their plain and ordinary meaning as understood by a person of ordinary skill in the art at the time of the invention in light of the specification and the prosecution history (a "POSA"). *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (*en banc*). The ordinary and customary meaning is determined by a POSA as of the priority date of the patent, which NCS claims is February 2013.[1] The construction of claim terms may take into

[1] In this circumstance, a POSA is a person with a Bachelor's degree, Master's degree, and/or Ph.D. in Mechanical Engineering or Petroleum Engineering, or at least five years of experience working in horizontal well construction. Ex. 1, at ¶ 35.

account sources of intrinsic evidence, including the claims themselves, the specification, and prosecution history. *Phillips*, 415 F.3d at 1314. "The specification is the 'single best guide to the meaning of a disputed term.'" *Kaneka Corp. v. Xiamen Kingdomway Group Co.*, 790 F.3d 1298, 1304 (Fed. Cir. 2015) (quoting *Phillips*, 415 F.3d at 1315). The prosecution history can also provide relevant evidence of "how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution." *Phillips*, 415 F.3d at 1317 (citations omitted).

Embodiments in the specification can prove significant, *Accent Packaging, Inc. v. Leggett & Platt, Inc.*, 707 F.3d 1318, 1326 (Fed. Cir. 2013), but the specification should not be used to read limitations into the claims, except in instances where the patentee has been his own lexicographer and redefined a claim term, or in instances of clear disavowals of claim scope. *Hill-Rom Services, Inc. v. Stryker Corp.*, 755 F.3d 1367, 1371-74 (Fed. Cir. 2014). Similarly, limitations should not be read out of the claims, as all terms should be given effect and not rendered superfluous – **even if it renders the claims inoperable or invalid**. *See Hill-Rom*, 755 F.3d at 1371-74; *Warner-Jenkinson Co. v. Hilton Davis Chem. Co*., 520 U.S. 17, 29 (1997) ("Each element contained in a patent claim is deemed material to defining the scope of the patented invention"). Where claims are inoperable or invalid, they may not be redrafted in the *Markman* process "to make them operable or sustain their validity." *Lucent Techs. v. Gateway, Inc.*, 525 F.3d 1200, 1215 (Fed. Cir. 2008).

Beyond the intrinsic evidence, the Court also may consider extrinsic evidence during claim construction to help establish the meaning of claim terms to a POSA. *Phillips*, 415 F.3d at 1317-19. Extrinsic evidence "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Id.* at 1317 (citations

and internal quotations omitted). Extrinsic evidence, however, is "less reliable" than intrinsic evidence and cannot be used to contradict intrinsic evidence. *Id.* at 1318-19.

B. Indefiniteness

Patent claims must particularly point out and distinctly claim the subject matter of the invention. 35 U.S.C. § 112(b). A claim is invalid for indefiniteness when the claim, "read in light of the specification delineating the patent, and the prosecution history, fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). "[A] patent must be precise enough to afford clear notice of what is claimed, thereby appris[ing] the public of what is still open to them, in a manner that avoids [a] zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement claims." *Id.* at 899 (internal citations and quotes omitted).

IV. AGREED CLAIM TERMS

The parties agree that the following terms should be construed as follows:

Claim Term	Agreed Construction
"float shoe" (Claims 15 & 43)	a sealing device disposed at the lower end of the casing string
"a pressure . . . greater than a hydraulic pressure in the casing string" (Claims 28, 50, 55)	an applied pressure that is greater than the hydrostatic pressure in the casing string
"a portion of the sealed chamber is buoyant in the well fluid" (Claim 46)	the density of a portion of the sealed chamber is lower than that of the surrounding wellbore fluid

V. DISPUTED CLAIM TERMS

A. "internal diameter" (Claims 1, 22, 28, and 50)

Defendant Nine's Construction	Plaintiff NCS's Construction
the diameter of a fluid channel measured perpendicularly from the inner wall of the fluid channel through the center of the casing string, to the opposite inner wall	No construction

The term "internal diameter" is used throughout the claims, and the meaning of the term is a central dispute in this case, thus requiring the Court's attention. Indeed, the sole limitation that distinguishes the alleged invention of the '445 Patent from the prior art is that "the region where the rupture disc is attached . . . is parallel to the **internal diameter** of the casing string." Ex. 4, at 12 (emphasis added). This limitation is indefinite, as described in Section V.F, *infra*. Given the centrality of this term to the parties' dispute, Nine respectfully submits that construction of "internal diameter" is necessary to provide the jury with guidance as to the meaning of the term. *See Funai Elec. Co. v. Daewoo Elecs. Corp.*, 616 F.3d 1357, 1366 (Fed. Cir. 2010).

Nine's proposed construction clarifies and gives effect to the plain and ordinary meaning of the term "internal diameter" to a POSA in geometric terms. Ex. 1, ¶ 64. The term "internal diameter" is a phrase whose plain and ordinary meaning is the product of the ordinary meaning of its components. *See Altiris, Inc v. Symantec Corp*., 318 F.3d 1363, 1372 (Fed. Cir. 2003); Ex. 1, ¶ 64. Here, the term "diameter" has a clear and unambiguous ordinary meaning – "a straight line passing through the center of a circle and meeting the circumference or surface at each end." Ex. 6, at 341 ("*Diameter*"); Ex. 1, ¶ 65. When used with the term "internal," this definition specifies that the diameter describes an inner dimension of an object. Ex. 1, ¶ 65. Indeed, a POSA would recognize that the term "internal diameter" is often used to describe the diameter of fluid channels through various objects, such as pipes, float tools, or casing strings. *Id.*.

Nine's proposed construction is also consistent with the specification. *See Kaneka*, 790 F.3d at 1304. The specification describes the internal diameter of the casing string in relation to the constricted opening of the lower tubular member depicted in Figure 2. Ex. 2, at 7:64-66 ("These other members of the casing string may have an ID similar to the diameter of the constricted opening 27 of lower tubular member 18."). Ex. 1, ¶ 66. Accordingly, the Court should

construe "internal diameter" to mean the diameter of a fluid channel measured perpendicularly from the inner wall of the fluid channel through the center of the casing string, to the opposite inner wall." Ex. 1, ¶ 67.

B. "tubular member" (Claims 1, 22, 28, and 50)

Defendant Nine's Construction	Plaintiff NCS's Construction
An upper tubular member, and a lower tubular member coupled with the upper tubular member.	No construction.

Nine's construction is proper because the term "tubular member" does not have a plain and ordinary meaning. However, the term is used consistently throughout the specification, thereby providing an implicit definition that is incorporated into the claim. *See Amazin' Raisins Intern., Inc. v. Ocean Spray Cranberries, Inc.*, 306 Fed. Appx. 553 (Fed. Cir. 2008) (citation and internal quotations omitted) ("when a patentee uses a claim term throughout the entire patent specification, in a manner consistent with only a single meaning, he has defined that term by implication"). Nine submits that adopting this construction will assist the finder of fact in identifying the "tubular member" among various components of prior art or accused products.

While a POSA would be familiar with the term "tubular," this term is not frequently used with "member." Ex. 1, ¶ 69. Indeed, the specification ***never*** uses the term "tubular member" without qualification. Ex. 1, ¶ 70. Instead, all 62 uses of the term in the specification refer either to the "upper" or "lower" tubular member. *Id.* Therefore, the specification appears to equate the assembly of the upper and lower tubular members with the claimed tubular member. *Id.*. Nine's proposed construction incorporates verbatim the language of the specification, Ex. 2, at 2:49-54, which exactly parallels the claim structure:

'445 Patent (Ex. 2), Claims 1, 22, 28, and 50	'445 Patent (Ex. 2), at 2:49-54
"a rupture disc assembly comprising (i) a **tubular member** having an upper end and a lower end, the upper and lower ends configured for connection in-line with the casing string	"the rupture disc assembly comprises **an upper tubular member, and a lower tubular member coupled with the upper tubular member**.
and (ii) a rupture disc having a rupture burst in sealing engagement with a region of the **tubular member** within the upper and lower ends."	The rupture disc is held in sealing engagement between **the upper tubular member and the lower tubular member** by a securing mechanism."

There are no other structures in the specification that could arguably equate to a "tubular member." Ex. 1, ¶ 71. Accordingly, a POSA viewing the specification would conclude that Nine's proposed construction was correct.

C. "sealing engagement" (Claims 1, 22, 28, 50, and 55)

Defendant Nine's Construction	Plaintiff NCS's Construction
attached or secured to create a fluid-tight seal	a substantially fluid-tight seal

Nine's construction combines the specification's version of a definition of the term "sealing" with the plain and ordinary meaning of the term "engagement." In contrast, NCS's reads out any requirement related to "engagement."

The term "sealing engagement" is not a term with a clear plain and ordinary meaning, but the terms "seal" and "engage" do have plain meanings that can be relied upon to find a construction. *See Altiris*, 318 F.3d at 1372. To "seal" is "to fasten or close tightly by or as if by a seal" or "to close hermetically." Ex. 6, at 1105 ("*Seal*"); Ex. 1, ¶ 73. To "engage" is to "attach or secure." *Id.*, at 408 ("*Engage*") ; Ex. 1, ¶ 73. Accordingly, to be in sealing engagement is to attach or secure to fasten, close tightly, or close hermetically. Ex. 1, ¶ 73.

The term "sealing engagement" is used in a similar context in the specification, further supporting Nine's proposal. *See Kaneka*, 790 F.3d at 1304. The specification explains, in a preferred embodiment, that a rupture disc in sealing engagement "create[s] a fluid-tight seal" Ex. 2, at 9:26-31; Ex. 1, ¶ 74. This matches the plain and ordinary meaning of "seal," and provides a simpler definition of "sealing" in the context of the '445 Patent – "creating a fluid-tight seal." Ex. 1, ¶ 74. Accordingly, for the benefit of the jury, Nine proposes simplifying the ordinary meaning of "sealing" to "creating a fluid tight seal" to arrive at "attached or secured to create a fluid-tight seal." Ex. 1, ¶ 75.

D. "the rupture disc is. . . configured to rupture when exposed to a rupturing force greater than the rupture burst pressure" (Claims 1, 22, 29, and 56)

Defendant Nine's Construction	Plaintiff NCS's Construction
Term is indefinite under 35 U.S.C. § 112 Proposed Alternative – the rupture disc will rupture when exposed to a rupturing pressure greater than the rupture burst pressure	the rupture disc can rupture if exposed to hydraulic pressure that is higher than its rupture burst pressure

Nine respectfully submits that this term is indefinite because this claim term requires a POSA to compare a rupturing force and a rupturing pressure, which are fundamentally not comparable. Thus, a POSA would be unable to determine with reasonable certainty what this claim term refers to. *See Nautilus*, 572 U.S. at 901. As would be recognized by a POSA, a force and a pressure are not comparable because they use different units. Ex. 1, ¶ 78-80. Accordingly, a POSA cannot reasonably ascertain whether a rupturing force is greater than a rupture burst pressure. Thus, this term is indefinite. *See Nautilus*, 572 U.S. at 901; Ex. 1, ¶ 81.

This indefiniteness cannot be resolved by any reasonable construction. Ex. 1, ¶ 83. For example, a POSA may believe that the claim was intended to compare a rupturing ***pressure*** to a

rupture burst pressure, and substitute in "rupturing pressure" for "rupturing force." *Id.* Indeed, this is the only possible substitution that would make some sense to a POSA. *Id.* Nine therefore presents this understanding as an alternative construction. With that understanding of the term, a rupturing pressure is easily compared to a rupture burst pressure. *Id.* This understanding further would be supported by the specification, which provides only a single example of a "rupturing force" – "hydraulic fluid under pressure." Ex. 2, at 2:7-8; Ex. 1, ¶ 83.

However, a POSA would also discover that in the next paragraph "[t]he hydraulic pressure required to cause disruption of the securing mechanism is ***less than*** the hydraulic pressure that would normally be required to break the rupture disc." Ex. 2, at 2:19-21; Ex. 1, ¶ 83. This construction would thus contradict the specification, and is unlikely to be the proper construction of the term. *See NTP, Inc. v. Research in Motion, Ltd.*, 418 F.3d 1282, 1297 (Fed. Cir. 2005) (rejecting a proposed construction that "contradicts the test and figures of the written description). Instead, a POSA would not be able to say with reasonable certainty what was meant, rendering the term indefinite. Ex. 1, ¶ 84.

E. "rupturing force" (Claims 1, 22, 27, 29, 56, and 57)

Defendant Nine's Construction	Plaintiff NCS's Construction
Term is indefinite under 35 U.S.C. § 112 Proposed Alternative – rupturing pressure	a hydraulic pressure or impact force sufficient to rupture the rupture disc

As discussed in Section V.D above, Nine respectfully submits that "rupturing force" is indefinite because a POSA could not reasonably ascertain how to compare a "rupturing force" to a "rupturing pressure." Nine respectfully submits that the term "rupturing force" should be construed to have the same meaning throughout the claims. Thus, to the extent it renders the term discussed in Section V.D indefinite, it renders all other claims in which it appears indefinite.

Further, the Court should reject NCS's proposed construction of "rupturing force" because it contradicts its construction of the ***exact same*** term proposed in Section V.D above. Instead of simply proposing "hydraulic pressure," NCS's construction now incorporates an "impact force sufficient to rupture the disc." This concept is absent from the claims and is not supported by the specification and then should be rejected. Instead, the term is used consistently throughout the claims, and should be construed to have a consistent meaning. *In re Varma*, 816 F.3d 1352, 1363 (Fed. Cir. 2016) ("the same phrase in different claims of the same patent should have the same meaning."); *Phonometrics, Inc. v. Northern Telecom, Inc.*, 133 F.3d 1459, 1465 (Fed. Cir. 1998) ("A word or phrase used consistently throughout a claim should be interpreted consistently.").

F. "the region of the tubular member where the rupture disc is attached has a larger internal diameter that the internal diameter of the casing string and is parallel to the internal diameter of the casing string" (Claims 1, 22, 28, and 50)

Defendant Nine's Construction	Plaintiff NCS's Construction
Term is indefinite under 35 U.S.C. § 112 Proposed Alternative – a flat surface of the tubular member where the rupture disc is fastened, affixed, joined, or connected to the tubular member is circular and has a diameter larger than the internal diameter of the casing string, and defines a plane that is parallel to a plane defined by the set of internal diameters at a location in the casing string	In the first portion of the tubular member, the rupture disc is directly secured to and in sealing engagement with a cylindrical surface that is wider than and parallel to the inner surface of the casing string

This term is indefinite because it requires that two features which have no inherent direction must be "parallel." As a result, a POSA could not reasonably understand what is meant by the claim term, or determine if any particular accused product infringes the claim, rendering the claim indefinite. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. at 901; Ex. 1, ¶ 87.

1. "the region of the tubular member where the rupture disc is attached" (the "Attachment Region")

A POSA would understand that this portion of the construed term merely refers to a surface of the tubular member where the rupture disc is attached. Ex. 1, ¶ 90. Here, a "tubular member" refers to the assembly of the upper and lower tubular members. *See* Section V.B. Further, the term "attached" has a plain and ordinary meaning of "fastened, affixed, joined, or connected." Ex. 6, at 80 ("*Attach*"); Ex. 1, ¶ 90. Nothing more is needed to interpret this portion of the term. This portion of the claim term should thus be construed as "the region of the tubular member where the rupture disc is fastened, affixed, joined, or connected" (the "Attachment Region"). Ex. 1, ¶ 90.

2. "the region of the tubular member where the rupture disc is attached has a larger internal diameter than the internal diameter of the casing string"

A POSA would understand from this term that the Attachment Region must have an internal diameter that is larger than the internal diameter of the casing string. Ex. 1, ¶ 91. This implies that the Attachment Region must be circular in order to have a diameter. *Id.* But other than this inference, no further construction is needed. *Id.* Accordingly, Nine proposes that this portion of the claim term be construed as "the region of the tubular member where the rupture disc is fastened, affixed, joined, or connected is circular and has a larger internal diameter than the internal diameter of the casing string."

3. The phrase "the region of the tubular member where the rupture disc is attached . . . is parallel to the internal diameter of the casing string" is indefinite.

A POSA would not be able to ascertain with reasonable certainty the meaning of this portion of the claim term in its context, and therefore the term is indefinite. A POSA would understand that the term "parallel" carries its plain and ordinary meaning, which is "extending in the same direction, equidistant at all points, and never converging or diverging." Ex. 6, at 892

("*Parallel*"); Ex. 1, ¶ 92. Implicit in this definition is that, for two features to be parallel, they must both have an inherent direction. *Id.*

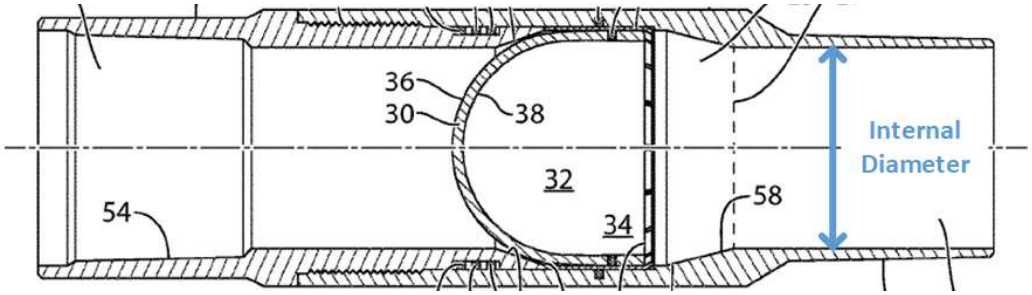
An internal diameter of a casing string does not have an inherent direction, and therefore cannot be parallel to another feature. Ex. 1, ¶ 93. A POSA would understand that an internal diameter is a scalar property of an object with a circular fluid pathway, such as a pipe. *See* Section V.A. It is a number, not something with direction. Ex. 1, ¶ 93. Accordingly, a POSA would be unable to determine if another feature was parallel to an internal diameter. *Id.* Because the comparison is impossible, a POSA cannot have reasonable certainty as to the scope the claim. The term is thus indefinite. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. at 901

Similarly, the claim language fails to identify any particular direction implied by the Attachment Region. Ex. 1, ¶ 94. Accordingly, a POSA does not know how to determine if it is parallel to the internal diameter, which likewise has no inherent direction. For these reasons, this portion of the claim is indefinite. *Id.*

4. If forced to construe "the region of the tubular member where the rupture disc is attached . . . is parallel to the internal diameter of the casing string," a POSA would arrive at a construction that contradicts the specification.

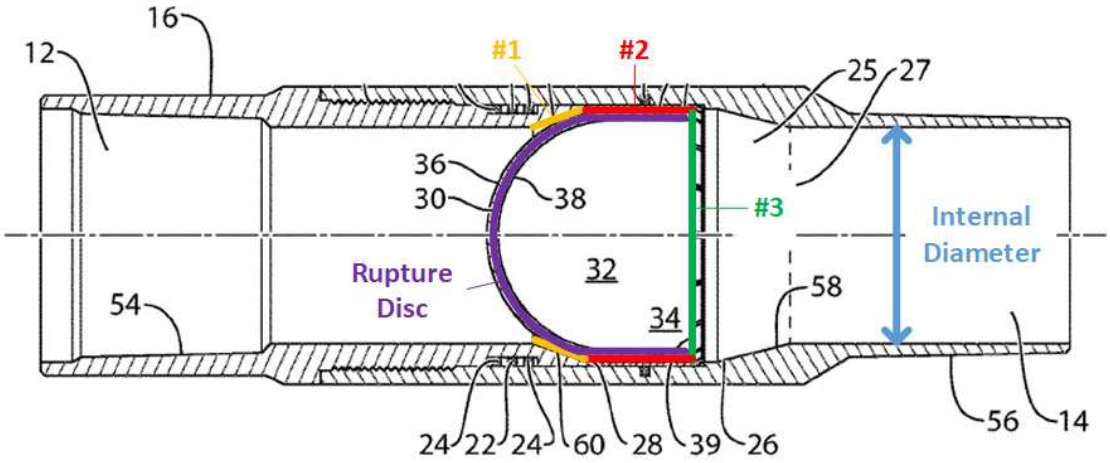
If forced to provide a construction that made sense of this portion of the claim term, a POSA would have to reduce the terms "internal diameter of the casing string" and the Attachment Region to geometric concepts that have inherent direction, and thus could be parallel. Ex. 1, ¶ 95. One way to do this would be to presume that "parallel to the internal diameter of the casing string" refers to being parallel to a plane defined as a set of measured internal diameters at a location in the casing string. *Id.* An internal diameter is measured as the distance from one inside wall of a pipe, through the center, to the opposite internal wall at a location in the casing string. *See* Section

V.A. This measurement forms a line segment, an example of which is shown below on Figure 2 of the '445 Patent. Ex. 1, ¶ 95.

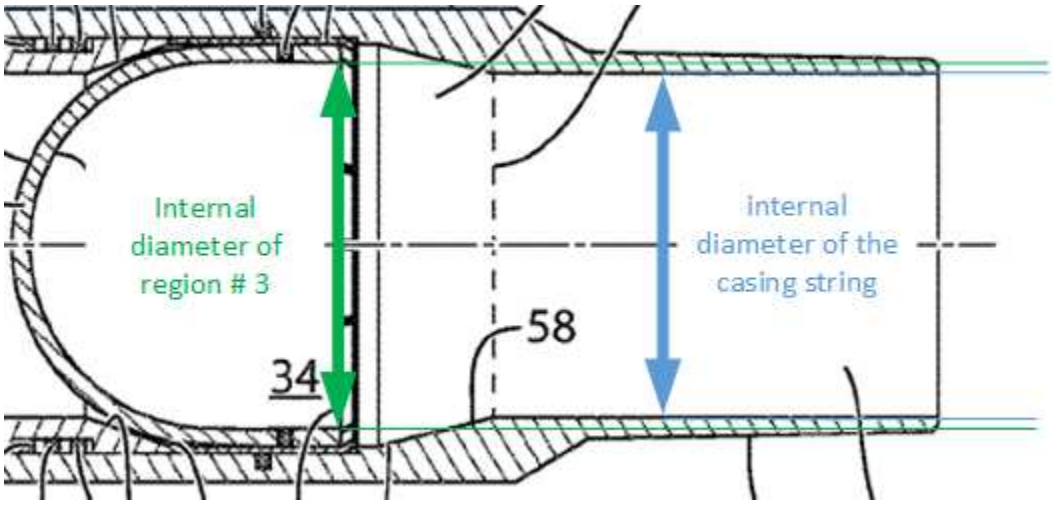


While this figure shows the internal diameter in a 2-dimensional cross-section, a POSA would understand that this represents a potential plane when viewed in three dimensions. Ex. 1, ¶ 96. In geometric terms, so long as the casing string is straight, any two non-parallel measured internal diameters at any axial location will define a plane that is parallel to a plane at any other axial location. *Id.* As a result, a POSA could determine that the internal diameter referred to in the claim actually refers to "a plane defined by the set of measured internal diameters at a location in the casing string" (an "Internal Diameter Plane"). *Id.*

Given this understanding of the internal diameter, a POSA could then look to Figure 2 to see if any potential Attachment Regions are also parallel to this plane. Ex. 1, ¶ 97. There are three possibilities, where the rupture disc appears to at least be in contact with the rest of the float tool, as shown below:

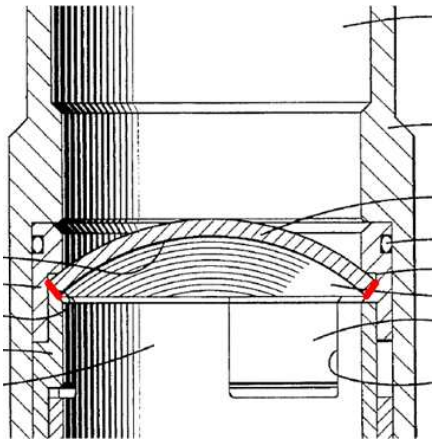
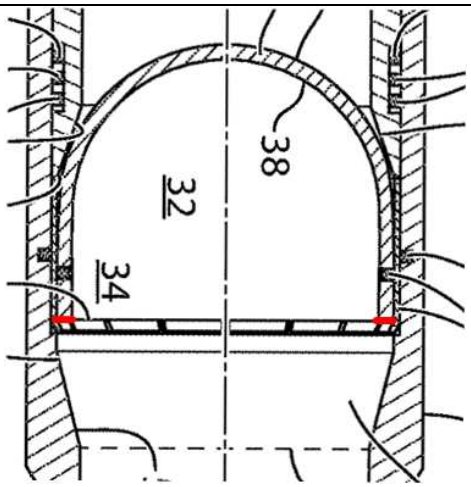


A POSA would identify attachment region # 3 as such a region, because it is generally flat and planar, and is parallel to the Internal Diameter Plane. Ex. 1, ¶ 98. In contrast, regions # 1 and # 2 are not planar at all, and thus could not be "parallel," nor are they parallel to the Internal Diameter Plane on the cross-section above. *Id.* Assuming that attachment region # 3 is correct, a POSA would therefore assume that an Attachment Region must therefore be flat, and define a plane that is parallel to the Internal Diameter Plane. *Id.* Further, a POSA would understand that the rupture disc would sit on the shear ring in Figure 2, having a contact area that was roughly circular – and thus has its own internal diameter, which would be larger than the internal diameter of the casing string, as shown below, and as required by the claim:



Ex. 1, ¶ 98. Nine's proposed alternative construction captures this understanding of the claim language. *Id.*

This understanding of the term is consistent with the prosecution history. Ex. 1, ¶ 99. In the last response before allowance, the patentee added this limitation in an attempt to distinguish the claims from Figure 3 of *Gano*. Ex. 4, at 12. Figure 3 of *Gano* is reproduced below next to Figure 2 of the '445 Patent.

	
***Gano* (Ex. 7), at Fig. 3** **(excerpted & annotated)**	**'445 Patent (Ex. 2), at Fig. 2** **(excerpted & annotated)**

The patentee argued that the claims were distinguishable from *Gano* because "Gano's plug 70 and rupture disc 102 are in sealing engagement with and attached to a region of a tubular member that is not parallel to the internal diameter of the casing string, but is instead sloped." Ex. 4, at 12. Here, the only sloped surface in Figure 3 of *Gano* is the surface adjacent to the circumferential edge of the rupture disc 102, highlighted in red above. Ex. 1, ¶ 100. Accordingly, a POSA would view this statement as confirming that the Attachment Region referred to in Figure 2 was the one where the circumferential edge of the rupture disc was resting on the shear ring 44, in region # 3. *Id.*

However, this alternative construction does not save the claim from indefiniteness. Ex. 1, ¶ 102. None of possible attachment regions #1-3 satisfy the other requirements of the claim – that the rupture disc be "attached" to the "tubular member." *Id.* In Figure 2, the rupture disc is depicted as being placed inside shear ring 44. *Id.* As a result, it ***only*** makes contact with the tubular member at shoulder 60. *Id.* Even that contact, however, is not an "attachment," as required by the claims. *Id.* Similarly, in both regions # 2 and # 3, the rupture disc is not even in contact with the tubular member, much less attached to it. *Id.* Accordingly, ***none*** of the attachment regions depicted in Figure 2 satisfy all the elements of this claim term. *Id.* This term is therefore indefinite because it cannot be understood by a POSA with a degree of reasonable certainty. *Id.*

G. "specific gravity . . . of the well fluid" (Claims 24 and 52)

Defendant Nine's Construction	Plaintiff NCS's Construction
Term is indefinite under 35 U.S.C. § 112	No Construction

Nine respectfully submits that this claim term is indefinite because a POSA would understand that the specific gravity of well fluid varies as a function of both temperature and depth. Ex. 1, ¶ 106-07. Specific gravity is the ratio of the density of a substance to the density of a standard material at standard conditions, usually water for a liquid or a solid, and air for a gas (i.e. relative density). *Id.* The relative density of well fluid is not a constant value across the depth of a well, but varies as a function of both temperature and pressure. *Id.* As a result, there is no single relative density value for the well fluid. *Id.* Therefore, in light of the specification and the claims of the '445 Patent, a POSA could not determine when the first specific gravity or the fluid in the sealed chamber of the flotation column was less than or lower than the specific gravity of the well fluid, because that density is not a constant value. *Id.* The term is therefore indefinite.

H. "disengage the rupture disc from sealing engagement" (Claim 55)

Defendant Nine's Construction	Plaintiff NCS's Construction
disengage the rupture disc from being attached or secured to create a fluid-tight seal	Before rupturing, move the rupture disc relative to the region

This term needs no additional construction beyond the construction of the term "sealing engagement" as discussed in Section V.C. This term merely indicates that the rupture disc is "disengaged" from sealing engagement, which has a plain and ordinary meaning that needs no further construction.

I. "rupture disc is configured to disengage from sealing engagement when exposed to a pressure greater than a hydraulic pressure in the casing string" (Claims 28 and 50)

Defendant Nine's Construction	Plaintiff NCS's Construction
Term is indefinite under 35 U.S.C. § 112	the rupture disc, before rupturing, can move relative to the first portion when exposed to a pressure that is greater than a hydrostatic pressure in the casing string (i.e. a disengaging pressure)

Nine submits that this term is indefinite because a POSA cannot reasonably determine how a rupture disc can be configured for the claimed purpose in view of the specification and drawings. In particular, this claim term requires a configuration of the "rupture disc," and not of the rupture disc assembly or any other claimed element. Ex. 1, ¶113. A POSA is left entirely to guess at how such a configuration could be achieved. *See, e.g. USB Bridge Soln's, LLC v. Buffalo, Inc.*, No. 1:17-cv-001158-LY, 2020 WL 1906898, at *7-8 (W.D. Tex. Apr. 17, 2020) (holding indefinite "digital circuit configured to convert" where specification does not describe such a configuration).

A POSA would understand what is meant by "disengage from sealing engagement" and what is meant by "when exposed to a pressure greater than a hydraulic pressure in the casing string." Ex. 1, ¶114. The term "disengage from sealing engagement" should be construed as

"disengage from being attached or secured to create a fluid-tight seal." *See* Section V.H. Further, the parties have agreed that the phrase "a pressure . . . greater than a hydraulic pressure in the casing string" refers to an applied pressure that is greater than the hydrostatic pressure in the casing string." *Id.* Accordingly, the required configuration means that a component must be configured to no longer be attached or secured to create a fluid-tight seal when exposed to a pressure that is greater than the hydrostatic pressure in the casing string. *Id.*

While a POSA would understand these terms, the term becomes indefinite when a POSA is told that the ***rupture disc*** must have this configuration. Ex. 1, ¶ 115. Indeed, the specification ***lacks any description at all*** of such a configuration of the rupture disc. *Id.* Each and every embodiment requires that the rupture disc be located in a "securing mechanism." Ex. 2, at Abstract, 2:10-11, 2:59-65, 6:28-31, 8:51-65, 9:32-42, 10:22-24; Ex. 1, ¶116. The only means by which a rupture disc could be configured to disengage from sealing engagement is by failing when a pressure is applied to the disc. Ex. 1, ¶ 116. However, the specification provides no indication that an embodiment without a securing mechanism is contemplated by the inventors. *See Accent Packaging*, 707 F.3d at 1326 ("a claim interpretation that excludes a preferred embodiment from the scope of the claims is rarely, if ever, correct."). Ex. 1, ¶116

VI. CONCLUSION

For the foregoing reasons, Nine respectfully requests that the Court find certain of the foregoing terms indefinite and adopt Nine's proposed constructions.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on the 30th day of October, 2020, a true and correct copy of the foregoing document was served on all counsel of record via the Court's CM/ECF system per Local Rule CV-5(b)(1).

/s/ Hilary L. Preston
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